

## CLAIMS

What is claimed is:

1. A helical antenna to broadcast a signal from an input line, comprising:
  - a) a base plate;
  - 5      b) a dielectric rod, mounted on the base plate;
  - c) a conductive helix, surrounding the dielectric rod, having a pitch angle of at least 12 degrees; and
  - d) a matching network, connected to the conductive helix, to match an impedance of the conductive helix with an impedance of the input signal.
- 10      2. A helical antenna as in claim 1, wherein the dielectric rod is an acetal resin rod.
3. A helical antenna as in claim 1, wherein the base plate is a conductive base plate.
- 15      4. A helical antenna as in claim 3, wherein the base plate is a metal base plate.
5. A helical antenna as in claim 3, wherein the base plate includes a plastic layer between the conductive base plate and the matching network.

6. A helical antenna as in claim 1, further comprising a dielectric enclosure attached to the base plate that encloses the antenna, wherein the dielectric enclosure enhances the helical antenna output.

5 7. A helical antenna to broadcast a signal from an input line, comprising:

- a) a conductive base plate;
- b) a dielectric rod, mounted on the base plate;
- c) a conductive helix, mounted around the dielectric rod, having a pitch angle of at least 12 degrees; and
- 10 d) a tapered strip line matching network, connected to the conductive helix to match the impedance of the conductive helix with the impedance of the input line.

8. A helical antenna as in claim 7, wherein the length of the tapered strip line matching network is  $\frac{1}{4}$  of the signal wavelength.

9. A helical antenna as in claim 7, wherein a length of the tapered strip line matching network conforms to the circumference of the dielectric rod.

10. A helical antenna as in claim 7, wherein the tapered strip line matching network provides a flat transmission response over a spectrum of frequencies

11. A helical antenna as in claim 7, wherein the dielectric rod is an acetal resin rod mounted on the base plate.

12. A directional antenna as in claim 13, wherein the acetal resin dielectric rod is Delrin.

13. A directional antenna as in claim 7, wherein the dielectric rod is nylon.

14. A directional antenna as in claim 7, wherein the number of turns of the conductive helix is selected from the group consisting of 5, 10 and 15 turns.

15. A directional antenna to broadcast a signal from an input line, comprising:

- a) a conductive base plate;
- b) an dielectric rod, mounted on the base plate;
- c) a conductive helix, mounted on the dielectric rod, having a pitch angle of at least 12 degrees; and
- d) a strip line matching network, attached to the conductive helix, which tapers from the connection point on a coaxial cable to a connection point with the conductive helix, wherein the matching network is configured to match the impedance of the conductive helix with the impedance of the input line.

16. A directional antenna as in claim 15, wherein the length of the strip line matching network is  $\frac{1}{4}$  of signal wavelength.

17. A directional antenna as in claim 15, wherein the strip line matching network conforms to the circumference of the dielectric rod.

18. A directional antenna as in claim 15, wherein the strip line matching network conforms to the circumference of the dielectric rod and forms a triangularly shaped matching network.

19. A directional antenna as in claim 15, wherein the strip line matching network conforms to the circumference of the dielectric rod and forms a crescent shaped matching network.

20. A directional antenna as in claim 15, wherein the strip line matching network tapers along a linear axis to form a matching network.

21. A directional antenna as in claim 15, wherein the strip line matching network tapers from a maximum width of approximately one radius of the dielectric rod down to a width of wire forming the helical antenna.